

What is claimed is:

1. A method for analyzing cells comprising:
 - (a) providing an array of locations which contain multiple cells wherein the cells contain one or more fluorescent reporter molecules;
 - (b) scanning multiple cells in each of the locations containing cells to obtain fluorescent signals from the fluorescent reporter molecule in the cells;
 - (c) converting the fluorescent signals into digital data; and
 - (d) utilizing the digital data to determine the distribution, environment or activity of the fluorescent reporter molecules within the cells.
2. The method of claim 1 wherein the array of locations are wells in a microtiter plate.
3. The method of claim 1 wherein the array of locations are microwells on a microplate.
4. The method of claim 1 wherein the fluorescent reporter is added to the cell.
5. The method of claim 1 wherein the fluorescent reporter is produced by the cell.
6. The method of claim 1 wherein a computer means converts the digital data into the difference between the average cytoplasmic reporter molecule fluorescent intensity and the average nucleus fluorescent reporter molecule intensity.

7. The method of claim 1 wherein a computer means converts the digital data into the average cytoplasmic fluorescent reporter molecule intensity within the nucleus region.
8. The method of claim 1 wherein a computer means converts the digital data into the average fluorescent reporter molecule intensity within the cytoplasmic mask.
9. The method of claim 1 wherein 2 or 3 different fluorescent reporter molecules are in the cell.
10. A cell screening system comprising:
- (a) a fluorescent microscope having a microscope objective, an XY stage adapted for holding a plate with an array of locations for holding cells and having a means for moving the plate to align the locations with the microscope objective and a means for moving the plate in the direction to effect focusing;
 - (b) a digital camera;
 - (c) a light source having optical means for directing excitation light to cells in the array locations and a means for directing fluorescent light emitted from the cells to the digital camera; and
 - (d) a computer means for receiving and processing digital data from the digital camera wherein the computer means includes:

- i) a digital frame grabber for receiving the images from the camera,
- ii) a display for user interaction and display of assay results,
- iii) digital storage media for data storage and archiving, and
- iv) means for control, acquisition, processing and display of results

- 5 11. The cell screening system of claim 10 having a PC screen operatively associated with the computer for displaying graphs of data and images of cells having fluorescent reporter molecules.
12. The cell screening system of claim 10 wherein the computer means stores the data in a bioinformatics data base.

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